

Appln No. 09/440,148

Amdt date December 22, 2003

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**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

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Claim 1. (Previously Presented) A metrics server in an intranet comprising:

a network interface device configured to non-intrusively measure network traffic transferred in and out of an intranet for at least one connection, the at least one connection being a logical path from a specific source to a specific destination, the intranet being a network accessible only by authorized users; and

a processor coupled to the network interface device and configured to generate performance metrics for a predetermined measurement time interval using the measured network traffic for the at least one connection.

Claim 2. (Original) The metrics server of claim 1 wherein the at least one connection is delimited by a first packet from the specific source to the specific destination and a last packet from the specific source to the specific destination.

Claim 3. (Original) The metrics server of claim 2 wherein the specific source is identified by a source Internet Protocol address in the first packet and the specific destination is

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identified by a destination Internet Protocol address in the first packet for the at least one connection.

Claim 4. (Original) The metrics server of claim 3 wherein the specific source is the metrics server and the specific destination is at least one client outside the intranet and the measured network traffic includes packets being transferred between the metrics server and the at least one client.

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Claim 5. (Original) The metrics server of claim 3 wherein the specific destination is at least one client outside the intranet and the specific source is at least one server in the intranet and the measured network traffic includes packets being transferred between the at least one server and the at least one client.

Claim 6. (Original) The metrics server of claim 4 wherein the network interface device is further configured to filter the measured network traffic such that only header information contained within the packets being transferred are captured by the network interface device.

Claim 7. (Original) The metrics server of claim 6 further comprising a memory coupled to the network interface device and the memory stores the measured network traffic.

Claim 8. (Previously Presented) The metrics server of claim 7 wherein the memory further stores an active connection

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table containing entries for the at least one connection that is active during the predetermined measurement time interval and an entry is deleted from memory when the at least one connection for the entry is inactive when the predetermined measurement time interval expires.

Claim 9. (Currently Amended) The A metrics server in an intranet of claim 8 comprising:

a network interface device configured to non-intrusively measure network traffic transferred in and out of an intranet for at least one connection, the at least one connection being a logical path from a specific source to a specific destination, the intranet being a network accessible only by authorized users;

a processor coupled to the network interface device and configured to generate performance metrics for a predetermined measurement time interval using the measured network traffic for the at least one connection;

wherein the at least one connection is delimited by a first packet from the specific source to the specific destination and a last packet from the specific source to the specific destination;

wherein the specific source is identified by a source Internet Protocol address in the first packet and the specific destination is identified by a destination Internet Protocol address in the first packet for the at least one connection;

wherein the network interface device is further configured to filter the measured network traffic such that only header

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information contained within the packets being transferred are captured by the network interface device;

further comprising a memory coupled to the network interface device and the memory stores the measured network traffic;

wherein the memory further stores an active connection table containing entries for the at least one connection that is active during the predetermined measurement time interval and an entry is deleted from memory when the at least one connection for the entry is inactive when the predetermined measurement time interval expires; and

wherein the processor is further configured to update the active connection table based on the measured network traffic and the predetermined measurement time interval.

Claim 10. (Original) The metrics server of claim 9 wherein the processor is further configured to accumulate the performance metrics generated for the at least one connection that extends pass the predetermined measurement time interval.

Claim 11. (Original) The metrics server of claim 10 wherein the processor configured to generate performance metrics includes the determination of source and destination Internet Protocol addresses and timestamp information of the packets captured within the predetermined measurement time interval.

Claim 12. (Previously Presented) A metrics server in an intranet comprising:

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a network interface device configured to non-intrusively measure network traffic transferred in and out of an intranet for at least one connection, the at least one connection being a logical path from a specific source to a specific destination;

a processor coupled to the network interface device and configured to generate performance metrics for a predetermined measurement time interval using the measured network traffic for the at least one connection;

wherein the at least one connection is delimited by a first packet from the specific source to the specific destination and a last packet from the specific source to the specific destination;

wherein the specific source is identified by a source Internet Protocol address in the first packet and the specific destination is identified by a destination Internet Protocol address in the first packet for the at least one connection;

wherein the specific source is the metrics server and the specific destination is at least one client outside the intranet and the measured network traffic includes packets being transferred between the metrics server and the at least one client;

wherein the network interface device is further configured to filter the measured network traffic such that only header information contained within the packets being transferred are captured by the network interface device;

a memory coupled to the network interface device and the memory stores the measured network traffic;

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wherein the memory further stores an active connection table containing entries for the at least one connection that is active during the predetermined measurement time interval;

wherein the processor is further configured to update the active connection table based on the measured network traffic and the predetermined measurement time interval;

wherein the processor is further configured to accumulate the performance metrics generated for the at least one connection that extends pass the predetermined measurement time interval;

wherein the processor configured to generate performance metrics includes the determination of source and destination Internet Protocol addresses and timestamp information of the packets captured within the predetermined measurement time interval; and

wherein the predetermined measurement time interval is one minute.

Claim 13. (Original) The metrics server of claim 12 wherein the network interface device is further configured to intrusively measure network traffic transferred in and out of the intranet for the at least one connection for the generation of a specific performance metric.

Claim 14. (Previously Presented) A measurement infrastructure comprising:

a plurality of clients outside an intranet, the intranet being a network accessible only by authorized users;

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at least one server inside the intranet coupled to the plurality of clients outside the intranet; and

a metrics generator coupled to the at least one server, the metrics generator is configured to non-intrusively measure network traffic being transferred in and out of the at least one server and to generate performance metrics from the network traffic measured.

Claim 15. (Original) The measurement infrastructure of claim 14 wherein the network traffic measured by the metrics generator includes packets being transferred for at least one connection, the at least one connection being a logical path from the metrics server to one of the plurality of clients outside the intranet.

Claim 16. (Original) The measurement infrastructure of claim 15 wherein the performance metrics generated by the metrics generator is for a predetermined measurement time interval using the measured network traffic for the at least one connection.

Claim 17. (Previously Presented) A measurement infrastructure comprising:

a plurality of clients outside an intranet, the intranet being a network accessible only by authorized users; and

a first metrics server inside the intranet coupled to the plurality of clients and configured to non-intrusively measure network traffic being transferred in and out of the intranet and

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to generate performance metrics based on the network traffic measured.

Claim 18. (Original) The measurement infrastructure of claim 17 wherein the network traffic measured by the first metrics server includes packets being transferred for at least one first connection, the at least one first connection being a logical path from the first metrics server to one of the plurality of clients outside the intranet.

Claim 19. (Original) The measurement infrastructure of claim 18 wherein the performance metrics generated by the first metrics server is for a predetermined measurement time interval using the measured network traffic for the at least one first connection.

Claim 20. (Original) The measurement infrastructure of claim 19 further comprising a second metrics server that is configured to non-intrusively measure network traffic being transferred in and out of the intranet and to generate performance metrics based on the network traffic measured.

Claim 21. (Original) The measurement infrastructure of claim 20 wherein the network traffic measured by the second metrics server includes packets being transferred for at least one second connection, the at least one second connection being a logical path from the second metrics server to one of the plurality of clients outside the intranet.



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Claim 22. (Original) The measurement infrastructure of claim 21 wherein the performance metrics generated by the second metrics server is for a predetermined measurement time interval using the measured network traffic for the at least one second connection.

Claim 23. (Currently Amended) ~~The~~ A measurement infrastructure ~~of claim 22~~ comprising:

a plurality of clients outside an intranet, the intranet being a network accessible only by authorized users;

a first metrics server inside the intranet coupled to the plurality of clients and configured to non-intrusively measure network traffic being transferred in and out of the intranet and to generate performance metrics based on the network traffic measured;

wherein the network traffic measured by the first metrics server includes packets being transferred for at least one first connection, the at least one first connection being a logical path from the first metrics server to one of the plurality of clients outside the intranet;

wherein the performance metrics generated by the first metrics server is for a predetermined measurement time interval using the measured network traffic for the at least one first connection;

further comprising a second metrics server that is configured to non-intrusively measure network traffic being

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transferred in and out of the intranet and to generate performance metrics based on the network traffic measured;

wherein the network traffic measured by the second metrics server includes packets being transferred for at least one second connection, the at least one second connection being a logical path from the second metrics server to one of the plurality of clients outside the intranet;

wherein the performance metrics generated by the second metrics server is for a predetermined measurement time interval using the measured network traffic for the at least one second connection; and

wherein the first metrics server distributes performance metrics generated by the first metrics server to the second metrics server in the intranet.

Claim 24. (Original) The measurement infrastructure of claim 23 wherein the second metrics server distributes performance metrics generated by the second metrics server to the first metrics server in the intranet.

Claim 25. (Previously Presented) A measurement infrastructure comprising a plurality of clients outside an intranet;

a first metrics server inside the intranet coupled to the plurality of clients and configured to non-intrusively measure network traffic being transferred in and out of the intranet and to generate performance metrics based on the network traffic measured;

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wherein the network traffic measured by the first metrics server includes packets being transferred for at least one first connection, the at least one first connection being a logical path from the first metrics server to one of the plurality of clients outside the intranet;

wherein the performance metrics generated by the first metrics server is for a predetermined measurement time interval using the measured network traffic for the at least one first connection;

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a second metrics server that is configured to non-intrusively measure network traffic being transferred in and out of the intranet and to generate performance metrics based on the network traffic measured;

wherein the network traffic measured by the second metrics server includes packets being transferred for at least one second connection, the at least one second connection being a logical path from the second metrics server to one of the plurality of clients outside the intranet;

wherein the performance metrics generated by the second metrics server is for a predetermined measurement time interval using the measured network traffic for the at least one second connection;

wherein the first metrics server distributes performance metrics generated by the first metrics server to the second metrics server in the intranet;

wherein the second metrics server distributes performance metrics generated by the second metrics server to the first metrics server in the intranet; and

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wherein the distributed performance metrics includes only the performance metrics generated by the first metrics server and the second metrics server that are different from any previously distributed performance metrics by the first metrics server and the second metrics server.

Claim 26. (Original) The measurement infrastructure of claim 24 wherein the performance metrics generated by the first and second metrics servers are distributed on a predetermined periodic basis.

Claim 27. (Previously Presented) A measurement infrastructure comprising:

a plurality of clients outside an intranet;

a first metrics server inside the intranet coupled to the plurality of clients and configured to non-intrusively measure network traffic being transferred in and out of the intranet and to generate performance metrics based on the network traffic measured;

wherein the network traffic measured by the first metrics server includes packets being transferred for at least one first connection, the at least one first connection being a logical path from the first metrics server to one of the plurality of clients outside the intranet;

wherein the performance metrics generated by the first metrics server is for a predetermined measurement time interval using the measured network traffic for the at least one first connection;

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a second metrics server that is configured to non-intrusively measure network traffic being transferred in and out of the intranet and to generate performance metrics based on the network traffic measured;

wherein the network traffic measured by the second metrics server includes packets being transferred for at least one second connection, the at least one second connection being a logical path from the second metrics server to one of the plurality of clients outside the intranet;

wherein the performance metrics generated by the second metrics server is for a predetermined measurement time interval using the measured network traffic for the at least one second connection;

① wherein the first metrics server distributes performance metrics generated by the first metrics server to the second metrics server in the intranet;

wherein the second metrics server distributes performance metrics generated by the second metrics server to the first metrics server in the intranet;

wherein the performance metrics generated by the first and second metrics servers are distributed on a predetermined periodic basis; and

wherein the predetermined periodic basis is one minute after performance metrics have been generated by the first and second metrics servers.

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Claim 28. (Previously Presented) A method of providing network performance metrics using an intranet, the intranet having at least one server, the method comprising:

non-intrusively measuring network traffic between at least one server in an intranet and at least one client outside the intranet, the intranet being a network accessible only by authorized users; and

generating performance metrics from the network traffic measured between the at least one server and the at least one client within a predetermined measurement time interval.

Claim 29. (Original) The method of providing network performance metrics of claim 28 wherein the non-intrusive measurement of network traffic and the generation of performance metrics are performed by the at least one server.

Claim 30. (Original) The method of generating network performance metrics of claim 29 wherein the non-intrusive measurement of network traffic includes copying packets being transferred between the at least one client and the at least one server to a memory buffer of the at least one server.

Claim 31. (Original) The method of generating network performance metrics of claim 30 further comprising intrusively measuring network traffic between the at least one server and the at least one client in an intranet.

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Claim 32. (Original) The method of generating network performance metrics of claim 31 wherein the intrusive measurement of network traffic includes injecting and monitoring probing packets that are transferred between the at least one server and the at least one client outside the intranet.

Claim 33. (Currently Amended) ~~The~~ A method of generating network performance metrics of claim 32 providing network performance metrics using an intranet, the intranet having at least one server, the method comprising:

non-intrusively measuring network traffic between at least one server in an intranet and at least one client outside the intranet, the intranet being a network accessible only by authorized users;

generating performance metrics from the network traffic measured between the at least one server and the at least one client within a predetermined measurement time interval;

wherein the non-intrusive measurement of network traffic and the generation of performance metrics are performed by the at least one server;

wherein the non-intrusive measurement of network traffic includes copying packets being transferred between the at least one client and the at least one server to a memory buffer of the at least one server;

further comprising intrusively measuring network traffic between the at least one server and the at least one client in an intranet;

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wherein the intrusive measurement of network traffic includes injecting and monitoring probing packets that are transferred between the at least one server and the at least one client outside the intranet; and

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further comprising distributing performance metrics generated by the at least one server to another at least one server inside the intranet.

Claim 34. (Previously Presented) A method of providing network performance metrics using an intranet, the intranet having at least one server, the method comprising:

non-intrusively measuring network traffic for at least one connection, the at least one connection being a logical path between at least one server inside an intranet and at least one client outside the intranet, the intranet being a network accessible only by authorized users;

generating performance metrics from the network traffic measured based on the at least one connection within a predetermined measurement time interval; and

accumulating the generated performance metrics for the at least one connection that remains active beyond the predetermined measurement time interval.

Claim 35. (Original) The method of generating network performance metrics of claim 34 further comprising distributing performance metrics generated.



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Claim 36. (Original) The method of generating network performance metrics of claim 35 further comprising intrusively measuring network traffic for the at least one connection.

Claim 37. (Previously Presented) A method of providing network performance metrics using an intranet, the intranet having at least one server, the method comprising:

examining packets being transferred during a plurality of connections, such that each connection of the plurality of connections is a logical path between at least one server in the intranet and at least one client outside the intranet, the intranet being a network accessible by authorized users;

generating performance metrics from the examined packets for the plurality of connections upon the expiration of a predetermined measurement time interval;

accumulating performance metrics from the generated performance metrics for the plurality of connections for each of the plurality of connections that remain active beyond the predetermined measurement time interval;

creating a record for each connection of the plurality of connections that are active during a predetermined measurement time interval; and

deleting each created record corresponding to each connection of the plurality of connections that becomes inactive when the predetermined measurement time interval expires.

Claim 38. (Original) The method of generating network performance metrics of claim 37 further comprising distributing

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performance metrics generated and accumulated upon the expiration of a predetermined measurement time interval.

Claim 39. (Original) The method of generating network performance metrics of claim 38 further comprising continuing to examine packets and generate, accumulate and distribute performance metrics for a plurality of successive predetermined measurement time intervals.

Claim 40. (Previously Presented) The metrics server of claim 1 wherein the network interface device is further configured to intrusively measure network traffic transferred in and out of the intranet for the at least one connection for the generation of a specific performance metric.

Claim 41. (Previously Presented) The method of structuring network performance metrics of claim 28 further comprising intrusively measuring network traffic between the at least one server and the at least one client in an intranet.

Claim 42. (Previously Presented) The method of generating network performance metrics of claim 34 further comprising intrusively measuring network traffic for the at least one connection.

Claim 43. (Currently Amended) The A measurement infrastructure ~~of claim 17~~ comprising:

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a plurality of clients outside an intranet, the intranet being a network accessible only by authorized users;

a first metrics server inside the intranet coupled to the plurality of clients and configured to non-intrusively measure network traffic being transferred in and out of the intranet and to generate performance metrics based on the network traffic measured;

further comprising a second metrics server that is configured to non-intrusively measure network traffic being transferred in and out of the intranet and to generate performance metrics based on the network traffic measured, and

the first metrics server distributes performance metrics generated by the first metrics server to the second metrics server and

the second metrics server distributes performance metrics generated by the second metrics server to the first metrics server.

Claim 44. (New) A method of providing network performance metrics by a plurality of servers in an intranet being accessible only by authorized users, the method comprising:

non-intrusively measuring, by a first server in the intranet, network traffic between the first server and at least one client outside the intranet;

generating performance metrics, by the first server, from the network traffic measured between first server and the at least one client within a predetermined measurement time interval;

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intrusively measuring network traffic between the first server and the at least one client outside the intranet, the intrusive measurement including injecting and monitoring probing packets that are transferred between the first server and the at least one client outside the intranet; and

distributing performance metrics generated by the first server to a second server inside the intranet.

Claim 45. (New) A measurement infrastructure performed by servers inside an intranet, the intranet being a network accessible only by authorized users, comprising:

a first metrics server inside the intranet coupled to the plurality of clients and configured to non-intrusively measure network traffic being transferred in and out of the intranet and to generate performance metrics based on the network traffic measured;

a second metrics server configured to non-intrusively measure network traffic being transferred in and out of the intranet and to generate performance metrics based on the network traffic measured;

wherein the first metrics server is further configured to distribute performance metrics generated by the first metrics server to the second metrics server; and

wherein the second metrics server is further configured to distribute performance metrics generated by the second metrics server to the first metrics server.